# (19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 22 September 2005 (22.09.2005)

PCT

English

# (10) International Publication Number WO 2005/088330 A1

G01R 33/385 (51) International Patent Classification<sup>7</sup>:

(21) International Application Number:

PCT/IB2005/050604

- (22) International Filing Date: 17 February 2005 (17.02.2005)
- (26) Publication Language: English
- (30) Priority Data: 60/549,751

(25) Filing Language:

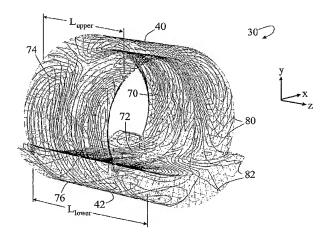
3 March 2004 (03.03.2004)

- (71) Applicant (for all designated States except US): KONIN-KLIJKE PHILIPS ELECTRONICS, N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (71) Applicant (for AE only): U.S. PHILIPS CORPORA-TION [US/US]; 1251 Avenue of the Americas, New York, NY 10020 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): OVERWEG, Johannes [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

- (74) Common Representative: KONINKLIJKE PHILIPS ELECTRONICS, N.V.; c/o LUNDIN, Thomas, M. 595 Miner Road, Cleveland, OH 44143 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

#### (54) Title: ASYMMETRIC ULTRA-SHORT GRADIENT COIL FOR MAGNETIC RESONANCE IMAGING SYSTEM



(57) Abstract: A magnetic field gradient coil includes upper and lower sections (40, 42) that define a coil bore (44) therebetween. The upper section (40) has an arcuate curvature (Cupper)transverse to a longitudinal direction and a length (Lupper)in the longitudinal direction that is smaller than a longitudinal length (L<sub>lower</sub>) of the lower section (42). Gradient coil windings (70, 72, 74, 76, 102, 104, 112, 114) impose one or more transverse magnetic field gradients on a static magnetic field generally oriented in the longitudinal direction. The coil windings are supported by both the upper and lower sections (40, 42) of the coils support. The coil windings supported by the upper section (40) are longitudinally limited in distribution to the longitudinal length (Lupper)of the upper section (40), which is sorter than its diameter. The coil windings supported by the lower section (42) are longitudinally distributed across substantially the longitudinal length. (Li<sub>oWer</sub>)of the lower section (42).

# WO 2005/088330 A1



### **Declaration under Rule 4.17:**

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM,

AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

### Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.